

# BAT54J

Schottky barrier single diode

Rev. 01 — 8 March 2007

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Schottky barrier single diode with an integrated guard ring for stress protection, encapsulated in a SOD323F (SC-90) very small and flat lead Surface-Mounted Device (SMD) plastic package.

### 1.2 Features

- Low forward voltage
- Very small and flat lead SMD plastic package
- Low capacitance
- Flat leads: excellent coplanarity and improved thermal behavior

### 1.3 Applications

- Voltage clamping
- Line termination
- Reverse polarity protection

### 1.4 Quick reference data



Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		-	-	200	mA
$V_R$	reverse voltage		-	-	30	V
$V_F$	forward voltage	$I_F = 1 \text{ mA}$	<sup>[1]</sup> -	-	320	mV

[1] Pulse test:  $t_p \leq 300 \text{ } \mu\text{s}$ ;  $\delta \leq 0.02$ .

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode		
2	anode		

sym001

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT54J	SC-90	plastic surface-mounted package; 2 leads	SOD323F

## 4. Marking

Table 4. Marking codes

Type number	Marking code
BAT54J	AP

## 5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	30	V
$I_F$	forward current		-	200	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$	-	300	mA
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p < 10$ ms	-	600	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[1] -	550	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{stg}$	storage temperature		-65	+150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1][2]	-	230	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	55	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

[2] Reflow soldering is the only recommended soldering method.

[3] Soldering point of cathode tab.

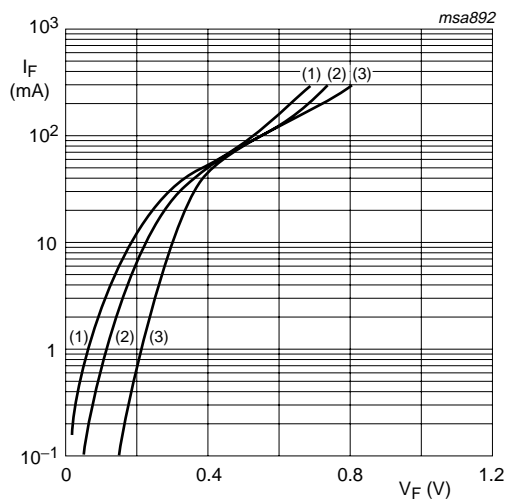
## 7. Characteristics

**Table 7. Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

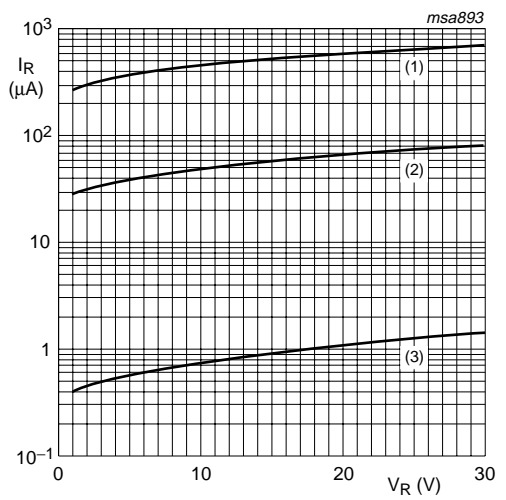
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 0.1\text{ mA}$	-	-	240	mV
		$I_F = 1\text{ mA}$	-	-	320	mV
		$I_F = 10\text{ mA}$	-	-	400	mV
		$I_F = 30\text{ mA}$	-	-	500	mV
		$I_F = 100\text{ mA}$	-	-	800	mV
$I_R$	reverse current	$V_R = 25\text{ V}$	-	-	2	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	-	10	pF

[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .



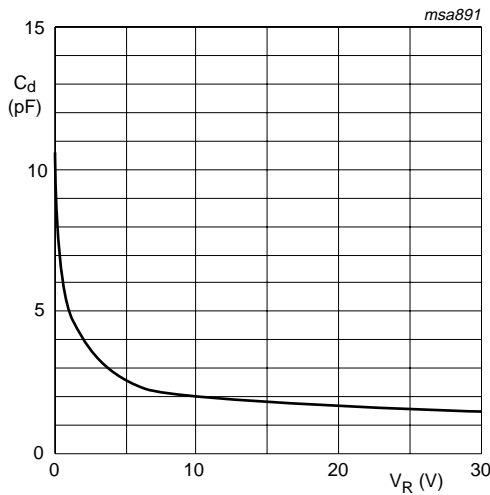
- (1)  $T_{amb} = 125^\circ\text{C}$
- (2)  $T_{amb} = 85^\circ\text{C}$
- (3)  $T_{amb} = 25^\circ\text{C}$

Fig 1. Forward current as a function of forward voltage; typical values



- (1)  $T_{amb} = 125^\circ\text{C}$
- (2)  $T_{amb} = 85^\circ\text{C}$
- (3)  $T_{amb} = 25^\circ\text{C}$

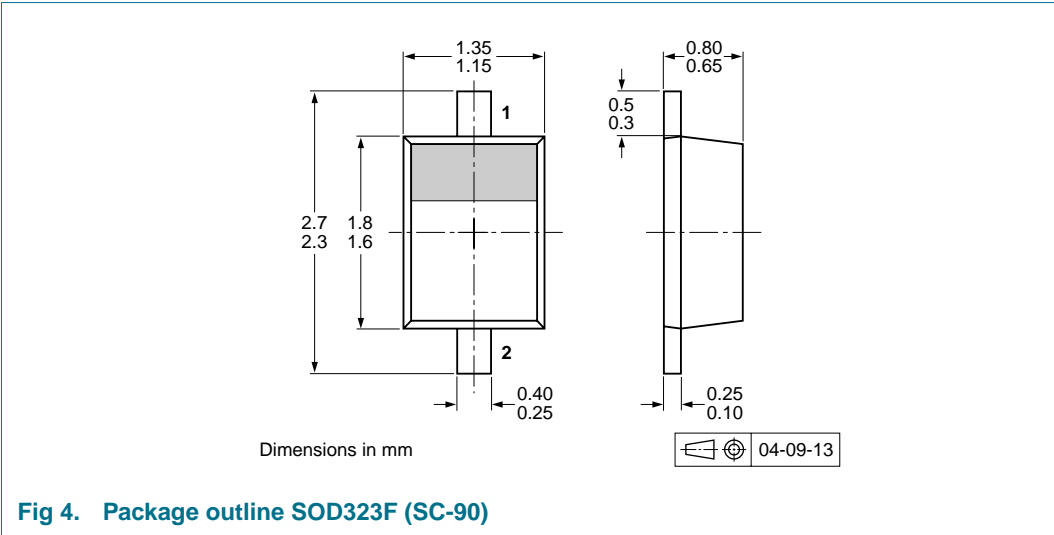
Fig 2. Reverse current as a function of reverse voltage; typical values



$T_{amb} = 25^\circ\text{C}$ ;  $f = 1\text{ MHz}$

Fig 3. Diode capacitance as a function of reverse voltage; typical values

8. Package outline



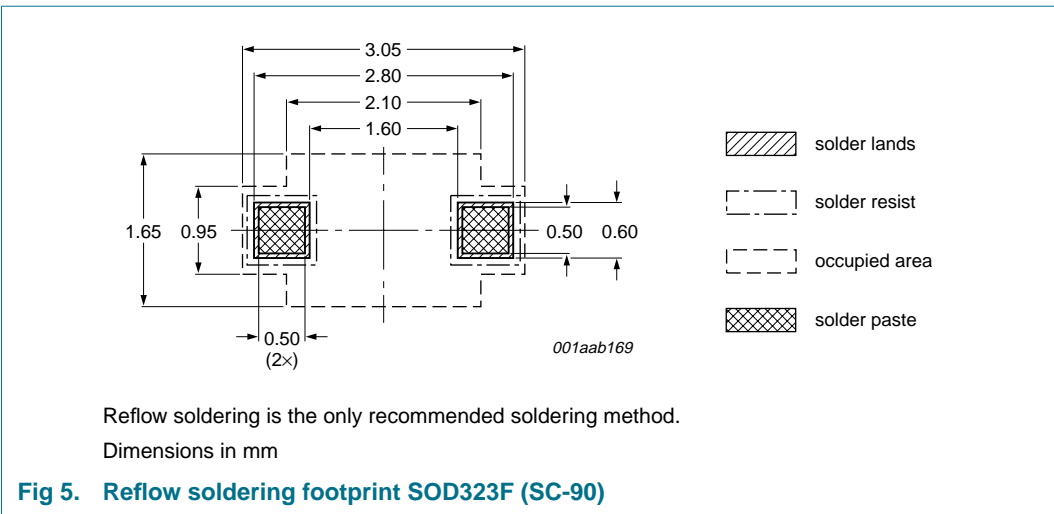
9. Packing information

**Table 8. Packing methods**  
*The indicated -xxx are the last three digits of the 12NC ordering code.*[\[1\]](#)

Type number	Package	Description	Packing quantity	
			3000	10000
BAT54J	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see [Section 13](#).

10. Soldering



## 11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAT54J_1	20070308	Product data sheet	-	-

## 12. Legal information

### 12.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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